Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**M. E. - SEMESTER – I • EXAMINATION – WINTER 2012**

**Subject code: 711102N** **Date: 09-01-2013**

**Subject Name: Fundamentals of I.C.Engine and Automobile**

**Time: 02.30 pm – 05.00 pm** **Total Marks: 70**

## Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| | | | |
|---|---|---|---|
| **Q.1** | **(a)** | The air-fuel ratio of a Diesel engine is 29:1. If the compression ratio is 16:1 and the temp. at the end of compression is 900 K, find at what cylinder volume the combustion is complete? Express this volume as a percentage of stroke. Assume that the combustion begins at the top dead centre and takes place at constant pressure. Take C.V. of the fuel as 42000 kJ/kg, R=0.287 kJ/kg K and Cv= 0.709 + 0.000028 T kJ/kg K. | **07** |
| | **(b)** | State and explain the factors responsible for change in valve timing in actual cycle as compared to ideal cycle. | **07** |
| **Q.2** | **(a)** | Explain different scavenging processes in two stroke engine with figure. | **07** |
| | **(b)** | Briefly explain a typical electronic engine management system. | **07** |
| | | **OR** | |
| | **(b)** | Write short note on vibration damper. | **07** |
| **Q.3** | **(a)** | Briefly discuss the air-fuel ratio requirement of a petrol engine from no load to full load. | **07** |
| | **(b)** | Explain Distributor type pump for CI engine. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain various types of nozzles used in CI engine with figure. | **07** |
| | **(b)** | Explain various phases of spray formation from nozzle. | **07** |
| **Q.4** | **(a)** | Explain working principle of synchromesh gear box. | **07** |
| | **(b)** | Draw typical layout of electrical system of an automobile & explain in brief. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain construction and working of centrifugal clutch. | **07** |
| **Q.4** | **(b)** | Explain working of stratified charged engine. | **07** |
| **Q.5** | **(a)** | Explain the concept of multipoint fuel injection system. | **07** |
| | **(b)** | Explain use of combustion charts for cycle analysis. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | State and explain three basic types of carburetors. | **07** |
| | **(b)** | Explain the concept and working of cam less engine. | **07** |

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